

What is claimed is:

1. A method for enhancing a video signal comprising:
  - mapping a luminance range of the video signal;
  - selecting a neutral point located at a dark point in the luminance range;
  - 5 and
  - processing the video signal by suppressing luminance to a darker side of the neutral point and enhancing luminance to a brighter side of the neutral point.
- 10 2. The method for enhancing a video signal of claim 1, whereby processing provides less contrast in dark regions and more contrast in bright regions of the video signal.
3. The method for enhancing a video signal of claim 1, further comprising:
  - 15 creating a luminance-mapping curve with at least one inflection point such that at lease one region has a concave upward arc and another region has a concave downward arc; and
  - applying the luminance-mapping curve to the luminance signal to enhance both brightness and contrast.
- 20 4. The method for enhancing a video signal of claim 3, further comprising:
  - adaptively adjusting the luminance-mapping curve over time according to an average luminance level of the video signal.
- 25 5. The method for enhancing a video signal of claim 4, whereby the luminance-

mapping curve is adapted over time by measuring mean and variance of the luminance signal and generating an adjustment to the luminance-mapping curve according to the measurements.

5     6.     The method for enhancing a video signal of claim 5, whereby the luminance-mapping curve is shifted in order to provide good contrast and preserve average luminance level after luminance mapping through time.

7.     The method for enhancing a video signal of claim 4, further comprising:  
10                 adjusting chrominance signals according to a change in luminance to preserve color saturation level.

8.     The method for enhancing a video signal of claim 7, further comprising:  
                       creating a chrominance-mapping curve; and  
15                 applying the chrominance-mapping curve to the chrominance signals to improve the color saturation level and improve the contrast of color chrominance components.

9.     The method for enhancing a video signal of claim 1, whereby only selected  
20     regions of the video signal are processed.

10.    The method for enhancing a video signal of claim 1, further comprising:  
                       dithering to reduce effects due to high contrast in certain luminance levels.

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11. A method for enhancing a video signal comprising:
- obtaining intensity and variation;
  - calculating average and variance of luminance and chrominance;
  - calculating luminance-contrast adjustment;
  - 5 constructing a luminance curve;
  - constructing a chrominance curve; and
  - applying the luminance curve and the chrominance curve to the video
- signal.
- 10 12. The method for enhancing a video signal of claim 11, whereby some or all of the operations are performed for every frame of the video signal.
13. The method for enhancing a video signal of claim 11, whereby the intensity and variation are input by a user.
- 15 14. The method for enhancing a video signal of claim 11, whereby the curves are realized as a fixed-point lookup table and mapping calculations are realized by table watching or third order or higher polynomials are used to emulate the curves.
- 20 15. The method for enhancing a video signal of claim 11, further comprising:
- obtaining an output luminance signal;
  - obtaining an output chrominance signal; and
  - restoring color saturation from chrominance adjustment.
- 25 16. A method for enhancing a video signal comprising:

obtaining user-input intensity and variation;  
calculating average luminance, luminance variance, and chrominance  
variance;  
calculating luminance-contrast adjustment from intensity, average  
5 luminance, and luminance variance;  
constructing a luminance curve from luminance-mapping curve,  
intensity, and luminance-contrast adjustment;  
constructing a chrominance curve from variation and chrominance  
variance; and  
10 applying the luminance curve and the chrominance curve to the video  
signal.

17. The method for enhancing a video signal of claim 16, whereby the curves are  
realized as a fixed-point lookup table and mapping calculations are realized by table  
15 watching.

18. The method for enhancing a video signal of claim 16, whereby third order or  
higher polynomials are used to emulate the curves.

20 19. The method for enhancing a video signal of claim 16, further comprising:  
obtaining an output luminance signal;  
obtaining an output chrominance signal; and  
restoring color saturation from chrominance adjustment.

25 20. The method for enhancing a video signal of claim 19, whereby the operations

of obtaining the output luminance signal, obtaining the output chrominance signal, and restoring color saturation from chrominance adjustment are performed for every pixel.